

## MATTRESS IMPROVEMENT CONTAINING MEANS FOR ROTATION SIGNALLING

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5    References Cited:

Morman et al., (US 6,475,600)

Hagglund (US 6,484,3380)

Shafer et al. (US 6,483,264)

Statement Regarding Fed sponsored R&D

- 10    This invention was developed entirely with personal and private funds, and no federal funds were ever solicited or employed in any aspect of its development.

Background of the Invention

- 15            This description reveals an improvement developed for a bed mattress containing signal means for identification of the correct mattress position in any day of the year, making it practical to implement a mattress rotation program designed to increase the useful life of the mattress. Normally the durability of a mattress depends on its construction (internal factors) and on the use to which it is submitted (external factors). Design and quality of mattress materials are important factors
- 20    (internal factors). The weight of the user is another factor (external factor). The symptom of excessive wear is its sagging, deformation or deflection. The said sagging, deformation or deflection are usually permanent and irreversible. In commercial establishments, such as in hotels, hospitals, boarding rooms, dormitories and the like, a deformed mattress is largely unacceptable.

The rate of deformation of a mattress can be slowed down. The most important management factor for slowing down the mattress deformation rate at any rate of use is the rotation of the mattress position in the bed. There are four possible positions for a mattress in a bed. Therefore, if a mattress is not rotated, deformation  
5 could occur four times faster than in the situation in which the mattress is rotated optimally. Conversely, if the mattress is properly rotated, its deformation rate, and therefore, its useful life, can be extended proportionally.

The industry recognizes the problem of mattress deformation as an important one. In the patent literature the problem is attacked in various forms, but none of  
10 them would be, even remotely, related to the one proposed in the present invention. The most common form to attack the problem consists in structural improvements to make mattresses more resistant to deformations. For example, Morman et al. (US Patent 6,475,600) proposes a new material and a process to fabricate a mattress that would be more resistant to deformation. In Hagglund (US Patent 6,484,338) a set of  
15 springs is assembled with a piece restricting the amplitude of spring compression and stiffening the structure that holds the different sets of springs, reducing the deformation potential of the mattress. This aspect is very important around the mattress edges, where people usually sit. It should be noticed that air or waer mattresses would probably not benefit from a rotation program. For example, in  
20 Shafer et al. (US Patent 6,483,264) an air mattress was conceived with two separate compartments, so that a couple could adjust the firmness of each side of the bed, according to personal preference, that is, an air mattress can be made uneven on purpose.

The principal objective of the present invention is to make available to personnel responsible for the maintenance and care of mattresses, both for domestic and commercial use, as in hotels, hospitals, prisons and other establishments that have beds, an improved mattress that permits the implementation of a rotation program to increase its useful life. The program is based on a rotation system for the mattress position over the bed that has four possible positions, facilitated by the use of signal means for management and control of the rotation program on the mattress cover. The signal means for management indicate which of the four possible positions is the correct one on the date of inspection. For example, in a monthly rotation system, if the current month is not indicated on the mattress in a directly readable manner, the mattress should have its position changed until the current month is shown in a directly readable manner. In this system, all four mattress positions are used uniformly, expanding significantly the useful life of the mattress, in comparison to another that is not turned, is turned sporadically or is turned in a random fashion.

#### Brief Summary of the Invention

This description reveals an improvement developed for a bed mattress containing signal means for identification of the correct mattress position in any day of the year, making it practical to implement a mattress rotation program designed to increase the useful life of the mattress.

#### Brief Description of the Drawings

The aspects of the present invention will be rendered clear and apparent, from the description that follows, that is based on the figures attached, illustrated

below. The drawings are offered as mere illustrations, and in order to help in the understanding of the object of this invention, and thus cannot be considered limiting in its scope.

Figure 1 numbers the sides of a bed mattress, for the purpose of defining the  
5 four positions that a mattress can take in relation to the bed, and should be analysed in conjunction with Tables I and II.

Figure 2 is illustrative of the position in which the signal means can be located on the mattress, visible to someone making the bed, and should be analysed in conjunction with Tables III, IV and V.

10 Figures 3 and 4 illustrate the signal means for mattress rotation control according to Table IV.

#### Detailed Description of the Preferred Embodiments of the Invention

The foregoing descriptions of the various material aspects of the method and device pertaining to the instant invention are merely illustrative and should not be in  
15 any way considered as limiting the scope of the invention, as the examples used for illustration and other equivalent examples will be logical deductions to those knowledgeable in the art in the light of the instant disclosure and of the claims that accompany this patent application.

It is commonly accepted that a rotation program will increase the useful life  
20 of mattresses. The difficulty in executing the program lies in knowing when and how to turn the mattress. For example, in a day assigned for turning, would it be necessary to rotate according to a vertical axis, a horizontal axis or both?

The control of such process is even more difficult because it is not sufficient to turn the mattress from side to side. Turning it from side to side and flipping the head-toe positions we obtain four possible mattress positions.

For example, if the mattress is described as a rectangular prism, as illustrated in Figure 1, containing, thus, six sides, and considering that the sides are numbered according to Table I, it would be logical to describe the possible positions of a mattress over a bed according to Table II.

Table I – Numbering of the sides of a mattress.

Identification fo the side	Number
Sleeping side (upper)	1
Opposite sleeping side (lower)	6
Side Panel (right)	2
Side Panel (left)	5
Front Side Panel (Head)	3
Back Side Panel (Toe)	4

The possible positions for a mattress over a bed can be described according to the following sequence S: Front side panel, side panel moving clockwise, back side panel, the other side panel moving clockwise, upper sleeping side, lower sleeping side.

In this manner the table below describes the four possible mattress positions in relation to the bed (Figure 1).

Table II – Description of the mattress positions in relation to a bed

POSITION	DESCRIPTION ACCORDING TO SEQUENCE S
1	3-2-4-5-1-6
2	3-5-4-2-6-1
3	4-5-3-2-1-6
4	4-2-3-5-6-1

5       The optimum mattress use consists in distributing its use uniformly among those four positions.

A mattress consists generically of a core and a cover. The core can be a steel spring structure, synthetic foam, or natural materials such as straw, cotton, animal hair, down, wool, and so on. The cover is normally a fabric. The cover can be joined to various cushioning materials, being usually stitched to those materials.

10      The present invention consists in a construction in which the cover contains signal means for the user to determine if the mattress is in the correct position on the verification date. If the position is incorrect in relation to the observation date, the user can determine which is the correct position and remedy the situation. Using mattresses equipped with the said signal means, commercial establishments can

15      manage the rotation process with ease and assurance, thereby expanding the useful life of its mattresses. The signal means can be, for example, guidemarks. Figure 2 indicates the positions on the mattress where the guidemarks should be positioned, that is, in opposite side panels ( 2 and 5, 3 and 4 our 1 and 6). In Figure 2 the guide marks A and B are on the back side panel whereas C and D are in the front side

20      panel. If A and B are on the upper sleeping side, C and D should be on the lower sleeping side, and so on and so forth. Note that B is upside down in relation to A and D is upside down in relation to C. Only one will be directly readable by the person standing in front of the bed. Specific examples of guide-marks are given in Tables s

25      III, IV and V.

Table III – Example of guidemarks – Seasons

Generic Guide marks	Specific Guidemarks
A	Spring
B	Summer
C	Fall
D	Winter

Table IV – Specific guidemarks – Numerical representation of months

Generic Guide marks	Specific Guidemarks
A	1 5 9
B	3 7 11
C	2 6 10
D	4 8 12

Table V – Secific guidemarks – Alphabetical representation of months

Generic Guide marks	Specific Guidemarks
A	Jan May Sep
B	Mar Jul Nov
C	Feb Jun Oct
D	Ap Aug Dec

For example, in Table IV, each number corresponds to a months of the year. Figures 3 and 4 illustrate labels with guidemarks where numbers 1, 5 and 9, upright, and numbers 4, 8 and 12, upside down, in one of the sides of the mattress, according to Figura 2, whereas on the opposite side numbers 3, 7 and 11, upside down, and numbers 2, 6 and 10, upright, are the guidmarks that defice the correct rotation

position of the mattress for each month of the year. For each month of the year there is only one position that is correct for the mattress, that is the position that shows the number of the month directly readable to the person making the bed, when that person is standing by the bed. In this fashion, the person making the bed can  
5 determine if the position is correct, if the mattress needs to be turned from side to side, head to toe, or both. In the same manner, the supervisor can easily check if the mattresses of the establishment are being turned in accordance with a set rotation program.

It can be inferred, from the examples provided, that the materials of  
10 construction, style, form and design of the cover and of the signal means for indicating position can vary, without altering the principle of the invention. It should be clear also that the cover with the signal means can be installed on the mattress during its construction, being thus an integral part of the original mattress, or the cover can be modified to include such signal means through retrofitting. The  
15 following examples show the usefulness of the present invention and its preferred embodiments.

#### EXAMPLE I

In a test, a foam mattress, size single, measuring approximately 75 inches in  
20 length and 35 inches in width was placed on a bed. Four sand bags weighing approximately 44 pounds were placed on the mattress in the following manner: three bags were placed over the mattress, covering a surface of approximately 52 inches by 12 inches, such that the center line of the bags was about 8 inches off the center line of the mattress. The fourth bag was then placed over the middle bag.

25 The test simulates a person weight about 176 lb that would be sleeping on the mattress, and positioned off-center. The bags were not removed for 12 weeks. After the twelve week period, the bags were removed and the mattress examined. The deformation was visible. Equally, a person that would lay on the mattress would feel that the mattress had developed unevenness and showed deformation.



## EXAMPLE 2

In a test with an identical mattress as described in example 1, four sand bags, identical to the ones described in example 1, were placed over the mattress in the same manner as described in example 1.

5           However, on this mattress, signal means for rotation management and control illustrated in Figures 3 and 4 and in Table IV were added to the mattress cover. Each week, along twelve weeks, the bags were removed, and the mattress subjected to rotation in accordance with the description of the present invention, however in this case the numbers 1 through 12 represented each of the 12 weeks of  
10       testing. After each rotation, the bags were reinstalled in the exact same position in relation to the bed. After the 12 week period, the bags were removed and the mattress examined. Only a slight trace of use was detected, and a person with normal weight and height laying on the mattress could not detect deformation and feel unevenness as in the example 1.

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## EXAMPLE 3

A test identical to the test in example 1 was conducted this time using a spring mattress. All the other test conditions were identical to those in example 1. After the 12 week period, the mattress was examined and signs of a slight  
20       deformation were visible.

## EXAMPLE 4

A test identical to the test in example 2 was conducted using a spring mattress. All the other test conditions were identical to those of the test in example  
25       2. After the period of 12 weeks, the mattress was examined and no deformation was observable.

Therefore, the invention deals with signal means, that can be guidemarks, visual, tactile or electronic, destined to provide an indication of the correct mattress position for each day of the year and thus permit a uniform distribution of the usage  
30       of mattresses, dividing such time uniformly among the four different positions of a mattress in relation to the bed.

The descriptions given with the various material details of the mattress which is the object of the instant invention are merely illustrative and in no way limiting of the scope of the invention, since the examples used, the illustrations, and other equivalents will become logical to those knowledgeable in the art as they read this revelation and the claims that accompany this patent application. In short, persons with reasonable knowledge and ability in the art can easily determine the essential features of the instant invention, from the descriptions given and can make various modifications, adapting it to different uses and conditions without however abandon the scope of the invention and that such modifications, adaptations, retrofits are justly and unequivocally integral part of the complete scope of the following claims.